

An indirect cast post and core technique

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With the increased effectiveness and predictability of endodontic therapy, the dentist is restoring more pulpless teeth (1). There are numerous methods for the restoration of endodontically treated teeth and most require the use of a post and core to support a full coverage restoration (2-7). Posts and cores can be fabricated either intraorally on the tooth or indirectly on the die. This paper presents one technique that utilizes a commercially available post system (Coltene/Whaledent Corp.) for the fabrication of an indirect cast post and core (CPC). Additionally, this paper will cite the indications for an indirect cast post and core, as well as, the advantages and disadvantages of the presented technique.



Figure 1: NSRCT #12



Figure 2: Post preparation

The indirect technique requires two patient appointments and a laboratory phase. In the first appointment, a post space is prepared, if not already provided during root canal therapy (Figure 1). The canal is prepared as deep as possible, leaving 4-5 mm of gutta percha apical to the post space (8-9) (Figure 2). The post preparation should have a positive stop, an anti-rotational feature, and a distinct margin (10-11). The tooth is then prepared for a crown with 1.5-2.0 mm of sound tooth structure beyond the post prep margin to produce the desired ferrule effect (8-11) (Figure 3). A plastic impression post is fitted to the canal preparation, modified for retention (Figure 4), and an elastomeric impression is made capturing the plastic post, post margin, and crown margin simultaneously (Figure 5). The tooth is provisionalized utilizing an aluminum post for added retention. The impression is poured in die stone, the stone cast is pindexed (Figure 6), and the die is trimmed to margin. The cast is mounted on an articulator with an opposing cast and sent to the laboratory for post fabrication.



Figure 3: Tooth preparation

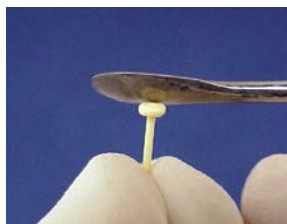


Figure 4: Plastic impression post



Figure 5: Pick-up impression



Figure 6: Pindexed cast

In the laboratory phase, the corresponding plastic burnout post is fitted to the die (Figure 7) and wax is used to customize it to the post preparation and build the core to the appropriate contours (Figure 8). The wax post and core pattern is margined, sprued, and invested for casting. The post and core is cast in Type III or IV gold or a silver-palladium alloy and passively fitted to the die (12). The sprue is then removed and the cast post and core is adjusted and finished on the die (Figure 9). With a small amount of calcium hydroxide, the post and core may be luted to the die to resist dislodgment during crown fabrication. Die spacer is applied, covering the post and core. The die is now ready for crown fabrication (Figure 10). A porcelain fused to metal (PFM) crown is made on the cast post and core included in the die (Figure 11 and 12).



Figure 7: Post pattern



Figure 8: Post and core pattern



Figure 9: Cast post and core



Figure 10: Die spaced CPC

In the second patient visit, the provisional is removed and the cast post and core is fitted to the tooth (Figure 13). A periapical radiograph is taken to check the fit (Figure 14). Next, the crown is seated and checked for proper form and function (Figure 15). Once the two pieces of the restoration seat properly, they are cemented individually and simultaneously. The final restoration is complete with removal of excess cement (Figure 16).



Figure 11: PFM



Figure 12: CPC and PFM



Figure 13: Cast post seat

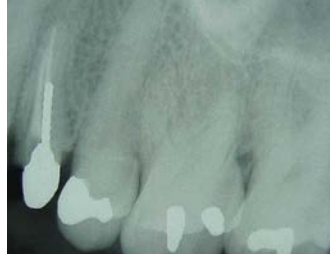


Figure 14: Check CPC film



Figure 15: PFM seat



Figure 16: Final restoration

Indications:

- Conservative root canal therapy
- Canals with circular cross section
- Multiple post and core fabrication
- Post preparations with undercuts
- Limited patient availability

Advantages:

- Simple technique
- Requires one less patient visit
- Allows for the fabrication and cementation of a CPC and crown simultaneously

Disadvantages:

- Crown is dependent on the fit of the cast post and core

The purpose of a post is to provide sufficient retention for a core and to stabilize (support) the remaining tooth structure (9). The presented indirect cast post and core technique is a simple way to achieve this purpose. Whether a cast post is fabricated directly or indirectly, the amount of remaining tooth structure (ferrule) is the key to clinical success for this restorative approach (10).

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